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Indian Standard

DIMENSIONS OF TOROIDS MADE OF
MAGNETIC OXIDES OR IRON POWDER

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MAGNETIC OXIDES OR IRON POWDER

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*Indian Standard***DIMENSIONS OF TOROIDS MADE OF
MAGNETIC OXIDES OR IRON POWDER****0. FOREWORD**

0.1 This Indian Standard was adopted by the Indian Standards Institution on 13 January 1976, after the draft finalized by the Magnetic Components and Ferrite Materials Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 While preparing this standard, assistance has been derived from IEC Document 51 (Central Office) 157 'Dimensions of toroids made of magnetic oxides or iron powder', issued by the International Electrotechnical Commission.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard gives dimensions of toroids to serve as a guide for design of toroids (ring cores) of rectangular cross section made of magnetic oxides or iron powder, for pulse and broad band transformers.

2. PREFERRED VALUES

2.1 For the outer diameter, the R5 series between 2.5 and 40 mm, as given below, should be considered as guidance:

2.5, 4, 6.3, 10, 16, 25 and 40 mm

NOTE — It should be recognized that an established practice may not easily be changed and also that the tooling costs for manufacturing toroids are relatively low when a long production run is involved.

*Rules for rounding off numerical values (*revised*).

3. TOLERANCE

3.1 The tolerance on both the inner and outer diameter and on the height is ± 3 percent or ± 0.15 mm, whichever is the greater.

3.2 The calculated values shall be appropriately rounded off to the nearest 0.05 mm.

NOTE — Tightening of the height tolerance to ± 0.1 mm for cores with a diameter up to 6.3 mm may be required to obtain appropriate control of the inductance factor.

4. DIMENSIONAL RATIO

4.1 The ratio of inner diameter, outer diameter and height of the toroid may be optimized with respect to $\frac{R_{dc}}{L}$ of the winding for constant total volume of the wound core.

Furthermore, the influence of secondary parameters such as the unavoidable rounding of edges, and the insulation on core and wire, is more important for small cores than for large ones.

4.2 The following recommended ratios may be used when setting up series of preferred dimensions for ferrite toroids:

$$\text{Inner to outer diameter, } \frac{d_2}{d_1} = 0.6 \quad \left(\frac{d_1}{d_2} = 1.67 \right)$$

$$\text{Height to inner diameter, } \frac{h}{d_2} = 0.5$$

5. EDGES

5.1 Sharp edges shall be removed.

6. DERIVED STANDARDS

6.1 By way of example, a possible standard for ferrite toroids has been given in Appendix A.

A P P E N D I X A

(Clause 6.1)

EXAMPLE OF A POSSIBLE STANDARD FOR A SERIES OF FERRITE TOROIDS

A-1. STANDARD FOR A SERIES OF FERRITE TOROIDS

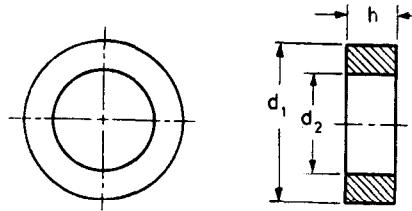
A-1.1 Table 1 read with Fig. 1 gives a complete example for the dimensions of a series of ferrite toroids in accordance with the basic information given in this standard.

TABLE 1 DIMENSIONS OF A SERIES OF FERRITE TOROIDS

(Clause A-1.1)

All dimensions in millimetres.

	NOMINAL SIZES						
	2.5	4	6.3	10	16	25	40
d_1	Min	2.35	3.85	6.10	9.7	15.50	24.25
	Nom	2.5	4.0	6.30	10	16	25
	Max	2.65	4.15	6.50	10.3	16.50	25.75
d_2	Min	1.35	2.25	3.65	5.80	9.30	14.55
	Nom	1.5	2.4	3.8	6.0	9.6	15
	Max	1.65	2.55	3.95	6.20	9.90	15.45
h	Min	0.6	1.05	1.75	2.85	4.65	7.25
	Nom	0.75	1.2	1.9	3.0	4.8	7.5
	Max	0.9	1.35	2.05	3.15	4.95	7.75

**FIG. 1 DIMENSIONS OF FERRITE TOROIDS**

INDIAN STANDARDS

ON

MAGNETIC COMPONENTS AND FERRITE MATERIALS

IS :

- 1176-1969 Dimensions for aerial rods and slabs made of ferromagnetic materials
- 1885 (Part XII)-1966 Electrotechnical vocabulary: Part XII Ferromagnetic oxide materials
- 1885 (Part XXXI)-1971 Electrotechnical vocabulary: Part XXXI Magnetism
- 1885 (Part XXXXI)-1975 Electrotechnical vocabulary: Part XXXXI Non-reciprocal electromagnetic components
- 2032 (Part XVII)-1975 Graphical symbols used in electrotechnology: Part XVII Symbols for ferrite cores and magnetic storage matrices
- 6077 (Part I)-1971 Permanent magnets: Part I General requirements and tests
- 6235-1971 Dimensions of pot-cores made of ferromagnetic oxides and associated parts
- 7416 (Part I)-1974 Dimensions for TV ferrite components: Part I Cores for deflection coil
- 7430-1974 Dimensions of screw cores made of ferromagnetic oxides
- 7431 (Part I)-1974 Tests for magnetic properties of ferrite aerial rods: Part I For long and medium wave receptions
- 7489-1974 Dimensions of cross cores (X-cores) made of ferromagnetic oxides and associated parts
- 7527-1974 Dimensions of loudspeaker magnets
- 7616-1974 Guide or calculation of the effective parameters of magnetic piece parts
- 7687-1974 Methods of measurement for cores for inductors and transformers for telecommunications
- 7717-1974 General requirements and tests for magnetic cores for application in coincident current matrix stores having a nominal selection ratio of 2 : 1 and in linear select memory stores
- 7930-1976 Dimensions of toroids made of magnetic oxides or iron powder
- 7934-1976 Dimensions of square cores made of magnetic oxides and associated parts

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